

### REMARKS

Applicants respectfully request entry of the remarks herein. Claims 1-16, 20 and 22-25 are currently pending. Reconsideration of the pending application is respectfully requested.

#### The 35 U.S.C. §103 Rejections

Claims 1-16, 20 and 23-25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Idaszak (US Patent No. 4,021,927) in view of Vezzani (EP 0710670 A1). According to the Examiner, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references (OA at page 7). This rejection is respectfully traversed. As described below, Idaszak and Vezzani disclose different configurations that cannot be combined with each other to properly arrive at the claimed methods.

The reactor in Idaszak includes three zones in series: an upper fluidized zone which is continuously subjected to mechanical agitation and where the starch substrate and reagents are introduced; a lower fluidized zone which is continuously subjected to mechanical agitation and where the gas is introduced; and a plurality of tubular zones intermediate to the upper and lower zones where the fluidized solids are subjected to heat transfer (see, for example, column 15, lines 45-60 and Figure 1). On the other hand, the claimed methods require a reactor system that includes a single reactor in which movement occurs from the introduction of the starch substrate and the gas in opposite directions as well as the configuration of the blades. The features of the reactor and the claimed method results in conditions that are not homogeneous; that is, the temperature increases from inlet to outlet, and the amount of modified starch increases from inlet to outlet. Those skilled in the art would appreciate that the hydrodynamics in a cascade of a two-tank reactor (i.e., as disclosed by Idaszak) is different from the hydrodynamics in a reactor having blades (i.e., as recited in the claimed methods). Their behavior is governed by different equations; their residence times are different; the variations of conditions within the reactors are different; and the heating and heat distributions are very different.

The Vezzani reference discloses a reactor system having two reactors in series; the first is a turboreactor, where the starch is modified, and the second is a turbodrier (see, for example,

Example 1, column 4, line 11-44). The turboreactor of Vezzani is operated at a regulated temperature of about 50°C, and the residence time of the starch in the turboreactor is approximately 30 seconds, after which the starch has a moisture content of about 25%. Contrary to Vezzani, the pending methods require a residence time of between one and 60 minutes at a temperature of between 50 and 220°C. Applicants note that, under the conditions disclosed by Vezzani, the starch in the turboreactor will not reach a temperature of 50°C. In addition, the turboreactor of Vezzani has a helical arrangement of blades that are oriented for centrifuging and simultaneously transporting the starch toward the outlet (see, for example, column 3, line 50-54), which is then continuously supplied to the turbodrier with a flow of hot air in the same direction of flow as the starch. On the other hand, the pending method claims require that the flow of air and the flow of starch be in opposing directions.

The Examiner has combined references directed toward two very different types of reactor systems. For example, in addition to the numerous differences outlined above, it is well known in the art that, in the type of reactor system of Idaszak (i.e., a cascade of continuously stirred reactors), the residence time of each of the particles can vary significantly, while in the type of reactor system of Vezzani (i.e., two reactors in series with blades), the residence time of all the particles is the same. Because of these significant differences, and because combining the disclosures of Idaszak with Vezzani would not result in the claimed methods, Applicants believe that the Examiner has improperly applied hindsight. The KSR Court, quoting *Graham* (383 U.S., at 36), stated that the “Supreme Court has ‘warn[ed] against ‘temptation to read into the prior art the teachings of the invention in issue’ and instruct[ed] courts to ‘guard against slipping into the use of hindsight’.” (*KSR International Co. v. Teleflex Inc.*, 127 S. Ct., at 1742 (2007)). In addition, the KSR Court stated that a “factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” (*KSR* at 1742).

In addition, independent claims 14, 24 and 25 require the addition of a reagent (e.g., to chemically modify the starch), while independent claim 1 recites the addition of a reagent as optional. Significantly, Vezzani discusses the difficulty in introducing a modification agent into their type of reactor, and indicates that modification by the agent using this type of reactor may be incomplete. One might assume that the use of a continuously stirred chamber with a longer

residence time as disclosed by Idaszak may solve this problem. However, as indicated above, since the residence time in the tanks of the system of Idaszak varies, the degree of modification of the starch in the type of reactor disclosed by Idaszak actually may be lower and could vary more between individual starch molecules. In addition, Vezzani mentions that the use of a batch reactor is the only method in which optimal contact between the hydroxylic groups of the starch and the modification agents can be achieved in an industrially advantageous and valuable manner (column 1, lines 33-38). Therefore, Vezzani considers a continuously operated tank reactor, such as that described by Idaszak, to be unsuitable for modification of starch on an industrial scale. Thus, with respect to the inclusion of a reagent, Vezzani teaches away from both their system and the system of Idaszak.

As described herein, Idaszak nor Vezzani nor the combination thereof discloses the claimed method and accompanying reactor configuration. Thus, the combination of Idaszak and Vezzani is not obvious. In view of the remarks herein, Applicants respectfully request that the rejection of claims 1-16, 20 and 23-25 under 35 U.S.C. §103(a) be withdrawn.

Claim 22 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Idaszak in view of Vezzani further in view of Ferguson (US Patent No. 5,766,366). According to the Examiner, Idaszak and Vezzani do not specifically teach that the starch substrate is conveyed from the inlet to the outlet in a continuous, plug-flow type manner, but that Ferguson teaches a method of hydrolyzing starch in which the starch is conveyed from the inlet to the outlet in a continuous, plug-flow reactor. This rejection is respectfully traversed.

As indicated herein, the combination of Idaszak and Vezzani does not make obvious pending independent claim 1. Therefore, contrary to the Examiner's assertion, dependent claim 22 also is not obvious. "Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious." *In re Fine*, 837 F.2d 1071 (C.A. Fed. 1988), citing *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed.Cir.1987); *In re Abele*, 684 F.2d 902, 910, 214 USPQ 682, 689 (CCPA 1982); and *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed.Cir.1983). Accordingly, Applicants respectfully request that the rejection of claim 22 under 35 U.S.C. §103(a) be withdrawn.

Applicant : Marc Charles Florent Berckmans et al.  
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### CONCLUSION

Applicants respectfully request allowance of claims 1-16, 20 and 22-25. If a telephone call to the undersigned would expedite prosecution, the Examiner is encouraged to do so. Please apply the fee for the enclosed Petition for Extension of Time and any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

/July 15, 2011/

/M. Angela Parsons/

Date: \_\_\_\_\_

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M. Angela Parsons, Ph.D.  
Reg. No. 44,282

Customer Number 26191  
Fish & Richardson P.C.  
Telephone: (612) 335-5070  
Facsimile: (877) 769-7945